

## Warm-Up 1

# Defining Hazardous Waste



Duration	1 class period
Grade Level	7-10
Key Terms/ Concepts	Corrosive Hazardous Substance Hazardous Waste Ignitable Reactive Toxic
Suggested Subjects	Health Life Science Physical Science Social Studies

## Purpose

In this exercise, students define and explore the relationship between hazardous substances and hazardous waste. The exercise allows them to identify a number of commonly used toxic chemicals, describe how these materials are used and disposed of, and sort them into the various types of hazardous waste. Students then discuss how the improper use and disposal of these materials can affect people in their community and the environment.

## Background

Many familiar products contain hazardous substances. Hazardous substance is a broad term that includes many chemicals and materials, including poisonous or **toxic** chemicals. Improper use and disposal of these products can result in the production of **hazardous waste** that can pollute our environment. Becoming more aware of the hazardous substances we encounter every day and of the types of hazardous waste they produce is the first step in learning how to properly handle and dispose of them, thereby protecting ourselves and our environment.

*Fact Flash 1: Hazardous Substances and Hazardous Waste* describes these terms and their application. For more information on hazardous substances, see the Suggested Reading list found at the end of the Haz-Ed materials. Other Haz-Ed materials that are related to this topic include *Fact Flash 7: Pollution Prevention* and *Activity 10: Pollution Prevention*.



## Preparation

1. Gather the following materials:
  - Copies for each student of *Fact Flash 1: Hazardous Substances and Hazardous Waste*.
2. Read Fact Flash 1 to prepare for the lesson.
3. Distribute Fact Flash 1 to the students and have them read it as homework.

## Procedure

1. Ask students what a **hazardous substance** is. Have them write their definitions on a sheet of paper or share them with the class. Record them on the chalkboard.
2. Define hazardous substances for the class:

Hazardous substances are materials that present a threat or potential risk of injury to people or the environment when they are produced, transported, used, or disposed of.
3. Discuss characteristics of hazardous substances. To be hazardous, a substance must have one or more of the following characteristics:
  - **Corrosive** — capable of chemically wearing substances away (corroding) or destroying them. For example, most acids are corrosive. They can eat through metal, burn human skin on contact, and give off vapors that burn the eyes. Acids found in batteries are corrosive.
  - **Toxic** — poisonous to people and other organisms. Toxic substances can cause illness—ranging from severe headaches to cancer—and even death if swallowed, and many also can be absorbed through the skin. Pesticides, weed killers, and many household cleaners are toxics.
  - **Ignitable** — capable of bursting into flames. Ignitable substances pose a fire hazard and irritate the skin, eyes, and lungs. They also may give off harmful vapors. Gasoline, paint, and furniture polish are ignitable substances.



- **Reactive** — capable of exploding or releasing poisonous gas when mixed with another substance or chemical. For example, chlorine bleach and ammonia are reactive. When they come into contact with each other they produce a poisonous gas.

*(NOTE: You may want to bring to class examples, such as those mentioned above, of the various types of household products that can become hazardous waste. Use caution in handling these products.)*

4. Discuss with the class some types of hazardous substances that may be found in their community.
5. Divide the class into 4 or 5 small groups. Distribute *Fact Flash 1: Hazardous Substances and Hazardous Waste* and have the students read it.
6. Write the questions below on the board, or make copies for the students. Have each group discuss the questions. Explain that each group should be prepared to participate in a class-wide discussion later in the period. Allow about 20 minutes for group discussion.
  - What household chemicals do people have in their homes or garages that are hazardous and that could become hazardous waste?
  - Do you think you or your family contribute to the hazardous waste problem? If so, how?
  - What problems could you, your family, and the community face as a result of being exposed to hazardous waste?
  - What businesses in your community do you think might use hazardous materials?
  - What are some ways hazardous waste problems can be prevented? Which of these things can you do? *(Give 1 or 2 examples, such as using vinegar and water to clean windows and not using pesticides on plants.)*
7. After about 20 minutes, have the class reassemble. Take each question in turn and have students share the concerns, opinions, and questions raised in their groups. You may want to have one or two students write unanswered questions and suggestions for preventing hazardous waste problems on the chalkboard for everyone to see.



8. About 5 minutes prior to the end of the period, summarize the discussion and identify subjects students may want to explore more fully in subsequent classes.
9. Introduce the concept that there are simple steps the students, their families, and the community can take to decrease and prevent pollution. *Fact Flash 7: Pollution Prevention* provides additional information. *Activity 10: Pollution Prevention* presents some ideas for students to explore and contains a handout on nontoxic alternatives that can be used around the house in place of cleaning fluid, laundry detergent, pesticides, and so forth. You can copy and distribute this handout to the class if desired.

## Extensions (Optional)

- Have students list chemical products in their homes and sort them into groups according to the types of hazardous waste they could produce (for example, lawn and garden pesticides belong in the “toxic” category, gasoline and lighter fluid belong in the “ignitable” category). *NOTE: Caution your students not to touch any of these substances while they are making their lists.*
- Have students contact the local government environmental services office or sanitation department and find out about recycling and other programs designed to minimize hazardous waste. For example, have them find out how used paint thinner and leftover paints should be disposed of in their community.
- Have students contact local gasoline service stations, oil change and auto lubricating shops, and nursery and garden supply companies and report on how these firms are required to dispose of hazardous substances.
- Have students contact your state environmental departments and ask if they have any posters or materials that show how to dispose of hazardous substances and hazardous waste, or that illustrate the use of alternatives to hazardous substances. Get some of these materials to use in your school for a display on Earth Day, Arbor Day, or other environmental event.